

GAS CHROMATOGRAPHY

Chromatographic Methods in general, and an Introduction to Gas Chromatography.

Analytical Applications and Techniques.

Apparatus for Separation, Detection and Sampling.

Theory of Chromatographic Separations.

Gas-Solid Chromatography and Special Applications of Gas-Liquid Chromatography.

LECTURER: Professor S. Sandler,
Department of Chemical Engineering,
University of Toronto.

ELECTROANALYTICAL METHODS OF ANALYSIS

Polarography-Theory, Instrumentation and Applications.

Amperometric Titrations.

Electrolytic Separations.

Coulometry at Controlled Potential.

Coulometric Titrations at Constant Current.

LECTURER: Dr. J. A. Page,
Department of Chemistry,
University of Toronto.



**UNIVERSITY OF TORONTO
UNIVERSITY EXTENSION**

Session 1959-60

Course on

INSTRUMENTAL METHODS OF ANALYSIS

sponsored by the
**CHEMICAL INSTITUTE OF CANADA,
TORONTO SECTION.**

P&G-0220
(10)

INSTRUMENTAL METHODS OF ANALYSIS

Wednesdays

20 lectures

This course, which is offered in co-operation with the Chemical Institute of Canada, Toronto Section, has been designed for graduate chemists and chemical engineers. It is a refresher course and is one of the series sponsored by the Institute and given yearly through the Division of University Extension. The programme of lectures has been arranged by staff members of the Departments of Chemistry, Chemical Engineering and Geophysics, University of Toronto. To be discussed are some of the commonly-used instrumental methods of analysis, including infrared, ultraviolet, visible and Raman spectroscopy, mass spectrometry, gas chromatography and electroanalytical techniques.

TIME: 7.30 p.m., Fall term October 7 to December 9,
Winter term January 6 to March 9.

PLACE: Room 2034, Wallberg Building.

FEE: \$40.00.

Registration:

By mail or in person at Room 207, 65 St. George Street, 9 a.m. to 5 p.m. daily except Saturdays. Application forms and course literature may be obtained by writing to the Director, University Extension, 65 St. George Street, Toronto, or by telephoning WA. 3-6611, locals 301, 304, 526, 527. In order to accommodate students and enable them to enrol during the evening, registrations will be taken—

Monday	September 14th
Wednesday	September 16th
Monday	September 21st
Wednesday	September 23rd
Monday	September 28th

from 7.30 to 9 p.m. in the Wallberg Building, corner of St. George and College Streets.

PROGRAMME

INFRARED, ULTRAVIOLET, VISIBLE AND RAMAN SPECTROSCOPY

Introduction

Molecular spectra, methods of expressing spectroscopic data.

Infrared Spectra

Origin, typical instruments and instrumentation, experimental methods and results.

Applications of Infrared Spectra

Identification, characterization, qualitative and quantitative analysis, kinetic studies, etc.

Visible and Ultraviolet Spectra

Origin, instruments and instrumentation, experimental methods and results.

Applications of Electronic Spectra

Determination of structure, qualitative identification. Brief discussion about Raman spectra and its uses.

LECTURER: Dr. A. G. Brook,
Department of Chemistry,
University of Toronto.

ANALYTICAL MASS SPECTROMETRY

Introduction

General properties of mass spectrometers as applied to chemical analysis.

Theory and Operation

Magnetic deflection, time of flight and trochoidal types.

Relation of Observed Mass Spectra to Chemical Composition

Sensitivity, calibration, discrimination and interference in analysis of multi-component systems.

Data Handling Techniques

Analysis of complex systems, using commercial instruments.

Special Analytical Techniques

Spark emission, solid source ionization, stable isotope dilution analysis, ultra high sensitivity instruments.

LECTURER: Dr. A. M. Farquar,
Department of Geophysics,
University of Toronto.